



JCS-99-060

May 26, 2000

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11:30:00

To: Commissioner of Patents and Trademarks
Washington, D.C. 20231

Fr: George O. Saile, Reg. No. 19,572
20 McIntosh Drive
Poughkeepsie, N.Y. 12603

Subject:

Serial No. 09/518,204 03/03/00

Paul Kwok Keung Ho, Mei Sheng Zhou,
Chockalingam Ramasamy

IMPROVED CHEMICAL AGENT ADDITIVES
IN COPPER CMP SLURRY

Grp. Art Unit: 1746

Accepted

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MAY 31 2000
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INFORMATION DISCLOSURE STATEMENT

Enclosed is Form PTO-1449, Information Disclosure Citation
In An Application.

The following Patents and/or Publications are submitted to
comply with the duty of disclosure under CFR 1.97-1.99 and
37 CFR 1.56. Copies of each document is included herewith.

U.S. Patent 5,575,885 to Hirabayashi et al., "Copper-Based
Metal Polishing Solution and Method for Manufacturing
Semiconductor Device", describes a copper-based metal polishing
solution which hardly dissolves a Cu film or a Cu alloy film
when the film is dipped into the solution, and has a
dissolution velocity during polishing several times higher than
that during dipping.

U.S. Patent 5,770,095 to Sasaki et al, "Polishing Agent and Polishing Method Using the Same", describes a CMP process using BTA derivatives to form a protective film of Cu(I)BTA complex.

U.S. Patent 5,897,379 to Ulrich et al., "Low Temperature System and Method for CVD Copper Removal", describes a system and method for the low temperature cleaning of copper contaminants from an IC (integrated circuit) wafer which prevents the formation of copper oxides.

U.S. Patent 4,251,384 to Rooney, "Aluminum Polishing Compositions", describes adding an aromatic ring compound in which at least 2 hetero atoms aluminum polishing solutions that inhibit etched finishes containing phosphoric, nitric, and sulphuric acids.

An article by V. Brusic et al., entitled "Copper Corrosion With and Without Inhibitors", J. Electrochem. Soc., Vol. 138, No. 8, August 1999, pp. 2253-2259, describes a study of the capacity of 1 H-benzotriazole (1 H-BTA) to provide a protective and stable surface film able to withstand harsh chemical and thermal environments.

An article by B.S. Fang et al., entitled "A Photoemission Study of Benzotriazole on Clean Copper and Cuprous Oxide", Surface Science, 176 (1986), pp. 476-490, describes a proposed model for the geometry and bonding of chemisorbed BTA which accounts for its corrosion inhibition on Cu, and for the corrosion inhibition, or lack of inhibition, by molecules to BTA.

An article by K. Cho et al., entitled "Adsorption and Film Growth of BTA on Clean and Oxygen Adsorbed Cu(110) Surfaces", Applied Surface Science, 87/88 (1995), pp. 380-385, describe phases of BTA as formed on a clean Cu(110)-1X1 surface [i.e., the c(4 X 2) commensurate phase] and as adsorbed of the oxygen-induced Cu(110)-2X1 surface [i.e., a fully disorder structure].

Sincerely,

A handwritten signature in black ink, appearing to read 'SBA', with a long horizontal flourish extending to the right.

Stephen B. Ackerman,
Reg. No. 37761